REMARKS

Claims 1-20 are pending in the application. Favorable reconsideration in light of the remarks which follow is respectfully requested.

The Primary Obviousness Rejection

Claims 1-3, 5, 7-11, 14, and 16 have been rejected under 35 U.S.C. § 103(a) over Uozumi (U.S. Patent 6,261,953) in view of Kondo (U.S. Patent 6,596,638). Uozumi relates to forming a copper oxide film on a copper surface using an ammonia-hydrogen peroxide solution having a pH of 8-10, then removing the copper oxide film with a solution having a weak oxidizing property such as a diluted hydrochloric acid solution. The copper oxide film contains an ammonia complex. Uozumi clearly teaches that the presence of ammonia is important (see Col. 10, line 38).

Kondo relates to a polishing method for metal films involving mechanically rubbing a metal surface with an oxidizer (such as hydrogen peroxide) and a substance which renders oxides water soluble (such as inorganic or organic acids). However, in the Background section, Col. 5, lines 17-31 describes polishing solutions containing citric acid or aminoacetic acid and hydrogen peroxide.

The Examiner contends that it would have been obvious to replace the ammonia of the ammonia-hydrogen peroxide solution of Uozumi with an organic acid of Kondo to provide a wider range of stability for etch process, as taught by Figure 26 of Kondo. The Examiner notes that the sharp rise in etch rate versus pH for the ammonia-hydrogen peroxide solution of Uozumi as shown in Figure 6 is not desirable for process control.

The Examiner further contends that it would have been obvious to use an organic acid of Kondo in the second solution of Uozumi to solubilize the byproduct of the first ammonia-hydrogen peroxide solution because Kondo shows how organic acids are used in scratch free polishing.

Applicants respectfully disagree with both contentions made by the Examiner for several reasons. Essentially, there would have been no motivation for one skilled in the art to make the modifications proposed by the Examiner to either the first or second solution of Uozumi.

It would not have been obvious to replace the ammonia of the ammonia-hydrogen peroxide solution of Uozumi with an organic acid of Kondo because 1) it would render the first solution of Uozumi inoperable, 2) one skilled in the art would not contradict the clear primary teaching of Uozumi, 3) the modification would NOT result in a copper oxide film that contains an ammonia complex.

Uozumi repeatedly states that its first solution, an ammonia-hydrogen peroxide solution, must have a pH of 8-10. The ammonia-hydrogen peroxide solution of Uozumi having a pH of 8-10 is used to form a copper oxide film WITHOUT roughening the surface of the copper. In Col. 9, lines 42-59, it is clearly stated that the pH range of 8-10 leads to the formation of the copper oxide film without roughening the adjacent surface of the copper. One skilled in the art would replace ammonia with an organic acid of Kondo because the acid would lower the pH of the first solution, and thereby remove the first solution from the stated operable parameters.

Moreover, the purpose of the first solution of Uozumi is to form a copper oxide film, whereas the purpose of the an organic acid of Kondo is to render metal oxides water soluble. These purposes are inconsistent; and for this additional reason one skilled in the art would not would not replace a key ingredient used to form a copper oxide film with an ingredient that solubilizes the film when the purpose of the solution is to form a copper oxide film. That is, one skilled in the art would not have undermined the purpose of the ammonia-hydrogen peroxide solution of Uozumi by decreasing and/or eliminating its ability to form a copper oxide film.

Figure 26 (and related Figure 9) of Kondo does NOT motivate one skilled in the art to replace the ammonia of the ammonia-hydrogen peroxide solution of Uozumi with an organic acid of Kondo. In fact, Figure 26 and related Figure 9 of Kondo teach that an

low/acid pH solution can solubilize and remove an oxide from a metal surface. Figure 26 and related Figure 9 of Kondo do NOT teach that an low/acid pH solution can form a metal oxide. Since the first solution of Uozumi is used to form a copper oxide film (but not remove a copper oxide film), one skilled in the art would not have replaced a component used to form a copper oxide film with a component that solubilizes the oxide film, because if there is no film formed, there is no need to solubilize the film.

The clear and primary teaching of Uozumi is that ammonia and hydrogen peroxide are combined in an aqueous solution to have a pH of 8-10. This clear and primary teaching of Uozumi is made numerous times throughout the Uozumi disclosure. Uozumi clearly teaches that the presence of ammonia is important (see Col. 10, line 38). This is because ammonia and hydrogen peroxide form copper oxide without roughening the underlying copper surface (see Col. 10, line 21). One skilled in the art would not ignore the clear and primary teaching of Uozumi by replacing one of the two key ingredients with a compound that does not function in a similar or equivalent fashion as the ingredient being replaced.

It would not have been obvious to replace the ammonia of the ammonia-hydrogen peroxide solution of Uozumi with an organic acid of Kondo because the modification of Uozumi would NOT result in a copper oxide film that contains an ammonia complex. Uozumi clearly teaches that the first solution forms a copper oxide film containing an ammonia complex. Replacing ammonia with an organic acid in the first solution of Uozumi would prevnt the formation of the copper oxide film containing an ammonia complex, and thus frustrate the purpose of the ammonia-hydrogen peroxide solution of Uozumi. Therefore, one skilled in the art would not have replaced the ammonia of the ammonia-hydrogen peroxide solution of Uozumi with an organic acid of Kondo.

For at least these reasons, it would not have been obvious to replace the ammonia of the first solution of Uozumi with an organic acid of Kondo. It is believed that the comments above are sufficient to merit withdrawal of the rejection. Nevertheless, the following comments are also provided.

It would not have been obvious to use an organic acid of Kondo in the second solution of Uozumi because such a modification contradicts a direct teaching of Uozumi. Uozumi clearly states that the second solution contains a weak oxidizing property. This is because the copper oxide film formed by the first solution is removed with a solution having a weak oxidizing property, such as a diluted hydrochloric acid solution (see Col. 9, line 51). Organic acids, such as those required by the claimed invention, have no oxidizing properties. Acids with oxidizing properties are inorganic or mineral acids. In the context of this technology, inorganic acids and organic acids are not equivalent (that is, inorganic acids and organic acids are not interchangeable). One skilled in the art would readily understand this, and consequently one skilled in the art would not have used an organic acid of Kondo in the second solution of Uozumi. Furthermore, the organic acid of Kondo is used to remove an oxide film in the context of a CMP process, where the action of the organic acid is assisted with the mechanical polishing action of the pad. Thus, the successful use the organic acid of Kondo without the mechanical action of the polishing pad is uncertain for one skilled in the art. For these additional reasons, with of the rejection is respectfully requested.

The Remaining Obviousness Rejections

Claim 12 has been rejected under 35 U.S.C. § 103(a) over Uozumi in view of Kondo and further in view of Miller (U.S. Patent 6,719,920). Claim 13 has been rejected under 35 U.S.C. § 103(a) over Uozumi in view of Kondo and further in view of Shimazu (U.S. Patent 6,547,843). Claims 17-20 have been rejected under 35 U.S.C. § 103(a) over Uozumi in view of Kondo and further in view of Singh (U.S. Patent 6,594,024). Claims 4, 6, and 15 have been rejected under 35 U.S.C. § 103(a) over Uozumi in view of Kondo. All of these rejections are based on the combination of Uozumi and Kondo. As discussed in detail above, the combination of Uozumi and Kondo is not sufficient to render any of the claims obvious. The additional cited art of Miller, Shimazu, and Singh

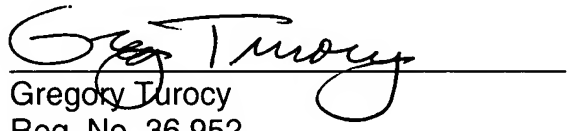
fails to cure the deficiencies of the combination of Uozumi and Kondo. Therefore, these rejections should also be withdrawn.

Should the Examiner believe that a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to our Deposit Account No. 50-1063.

Respectfully submitted,

AMIN & TUROCY, LLP



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